

Adabas Client for Java

Adabas Client for Java API

Version 2.2.2

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This document applies to Adabas Client for Java Version 2.2.2 and all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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Preface

This documentation contains information about the main concepts involved in the Adabas Client for Java. It also describes the main classes used, and how to add the example programs into Eclipse.

The following topics are covered:

Adabas Client for Java API	Explains the main concepts behind Adabas Client for Java API.
Use Cases	Common use cases.
Adabas Client for Java Main Classes	Descriptions of the main classes used by Adabas Client for Java.
Adabas Client for Java and Eclipse	How to use Adabas Client for Java with Eclipse.
Messages	Messages that are returned if errors occur while processing.



Note: The Installation directory of Adabas Client for Java contains a set of JavaDocs for Adabas Client for Java, as well as example Java programs.

1 About this Documentation

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Document Conventions

Convention	Description
Bold	Identifies elements on a screen.
Monospace font	Identifies service names and locations in the format <i>folder.subfolder.service</i> , APIs, Java classes, methods, properties.
<i>Italic</i>	Identifies: Variables for which you must supply values specific to your own situation or environment. New terms the first time they occur in the text. References to other documentation sources.
Monospace font	Identifies: Text you must type in. Messages displayed by the system. Program code.
{ }	Indicates a set of choices from which you must choose one. Type only the information inside the curly braces. Do not type the { } symbols.
	Separates two mutually exclusive choices in a syntax line. Type one of these choices. Do not type the symbol.
[]	Indicates one or more options. Type only the information inside the square brackets. Do not type the [] symbols.
...	Indicates that you can type multiple options of the same type. Type only the information. Do not type the ellipsis (...).

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- Add product feature requests.

Data Protection

Software AG products provide functionality with respect to processing of personal data according to the EU General Data Protection Regulation (GDPR). Where applicable, appropriate steps are documented in the respective administration documentation.

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The Adabas Client for Java API is used to introduce Adabas functionality into the Java programming language.

Adabas Mapping

Adabas Client for Java maps long names to the Adabas short names in the FDTs. The main advantages of this include:

- The map configuration is stored in an Adabas file which is part of the database. The mapping can be accessed from everywhere, even remotely.
- Various input formats can be used as the source of the map definitions. It is possible to use SYSTRANS files based on Natural DDMs to define the map; FDT comments and XML Schema files (XSD) can also be used.
- Data can be accessed without having to know the database ID and file number, only the map name is required.

The API provides a class called `AdabasMapper`, which performs all read and write operations out of and into the map configuration. The `AdabasMapper` also provides search functionality to find maps.

The `AdabasMapper` class produces so-called Adabas targets and Adabas sessions which are described below.

Adabas Target

The Adabas target defines the connection to the target database. This might be just a database ID, or, in case of mainframe databases where the Entire Net-Work port number is known, the target is a combination of the database ID and Entire Net-Work connection URL. The Software AG Directory Server is the reference for remote databases.

The Adabas target also contains a number of connection parameters, such as the host's endianness or the character set used. The Adabas target handles the current connection state.

Adabas Session

An Adabas session contains all Adabas user-specific information. This includes the user ID, process identification (EID) and some security-related information, such as the RACF or LUW Adabas Security credentials.

Adabas Client Java Session

An Adabas Client Java Session is essentially defined by the two parameters Adabas Target (`AdabasTarget.class`) and Adabas Session (`AdabasSession.class`). These two objects are created either directly, using the specific `AdabasTarget` or `AdabasSession` classes, or they can be created using the `AdabasConnection` helper class.

The `AdabasConnection` class is created using an SQL-like connection string. With an `AdabasConnection` instance you can create request instances which handle specific read, delete, update or write operations on the database. Each request contains information that is specific to the operation it provides. Multiple requests can be used per session. Multiple requests need to be used to read a different set of fields out of an Adabas database. If a number of Adabas files are accessed in an Adabas session, each access need to be distributed in several request classes. Internally, each request uses a format buffer and other Adabas-specific objects, which are generated on a per request basis.

Transaction

A transaction consists of a chain of request operations. Any number of transactions can be part of an Adabas session.

Request Chain Example

The following is an example of how a request chain might look:

```

AdabasTarget target = new AdabasTarget(getDynamicDbid());
try {
    /* Setting the target to not implicit close the request provides the possibility ↵
for multiple
    request in one Adabas session */
    target.setImplicitClose(false);
    /* Read target database on file 11 field "AA", "AB" */
    try (ReadRequest request = new ReadRequest(target, 11)) {
        request.addFieldsQuery(new String[] { "AA", "AB" });
        QueryResultList list = (QueryResultList) request.readIsnSequence();
    }
    /* Store records in file 17 and file 16 with different fields dependent on each ↵
file */
    try (StoreRequest storeRequest1 = new StoreRequest(target, 17)) {
        try (StoreRequest storeRequest2 = new StoreRequest(target, 16)) {
            /* Create a new record with corresponding fields and fill value */
            RecordEntry entry = storeRequest1.createRecordEntry(new String[] { "AA", ↵
"AE" });
            entry.addValue("AA", 123);
            /* Store entry - Dependent on the cache the store is not send to the ↵
database */
            storeRequest1.storeEntry(entry);
            try (ReadRequest request = new ReadRequest(target, 11)) {
                request.addFieldsQuery(new String[] { "AA", "AW" });
                QueryResultList list = (QueryResultList) request.readIsnSequence();
                list.output(System.out);
            } /* Close here is omitted */
            /* Create a new record for file 16 with corresponding fields and fill value ↵
*/
            RecordEntry entry = storeRequest2.createRecordEntry(new String[] { "AA", ↵
"AE" });
            entry.addValue("AA", String.format("%06d", i));
            storeRequest2.storeEntry(entry);
            /* Flush records to database file 16 */
            storeRequest2.endTransaction();
            /* Flush records to database file 17*/
            storeRequest1.endTransaction();
        }
    } /* Pay attention, a implicit ET is done here */
    /* Read with the same connection target the file 16 after the Transaction */
    try (ReadRequest request = new ReadRequest(target, 16)) {
        request.addFieldsQuery(new String[] { "AA", "A1", "AQ", "AW" });
        QueryResultList list = (QueryResultList) request.readIsnSequence();
        list.output(System.out);
    }
} finally {
    target.close();
}

```

An Adabas session can be reused after the current Adabas target connection is being closed; the target will open automatically if a new request is initiated on the target. If it is used for map-based

access, the AdabasConnection or the AdabasMapper instance will be used instead of the target and the file number.

Adabas Session Authentication Types

Adabas Client for Java supports the following Adabas session types:

Type	Description
NONE	The default Adabas ID is generated containing the user ID, host and an additional process identification (so-called ESID) describing the uniqueness.
ADA_SECURITY	The Adabas security password is sent to the database. Refer to <i>Adabas Security</i> in the Adabas documentation for further information.
ADA_PW_SECURITY	This session type supports the new Adabas Security on Linux, UNIX and Windows platforms. In addition to the Adabas ID, information like the user ID and password are required.
ADASAF	This session type is used to send credentials to a remote mainframe database, which is secured using ADASAF and the external security system RACF.

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The following chapter presents some common use cases for Adabas Client for Java.

Connecting to an Adabas Database Engine

The Adabas target can be a local database, or it can be a remote database connection path.

Local Database

A local Adabas database target is accessed using the classic ADALNK libraries to send Adabas calls. In this case, only a database number must be specified.

```
/* simple Adabas Database target definition (dbid) */
AdabasTarget target = new AdabasTarget(dbid);
target.open();
```

Remote Database

A remote Adabas database is referenced using an Entire Net-Work (WCP) URL connection string.

```
AdabasTarget(int dbid, java.lang.String url)
Adabas Target definition with an Entire Net-Work remote URL reference.
```

Sample URL reference: `tcip://<hostname>.<domainname>:<port>`

On mainframe platforms, Adabas Client for Java API uses the EBCDIC (037) character set to connect to and communicate with an Adabas server environment. Software AG recommends that you use UES-enabled mainframe databases in order to avoid this restriction.



Note: It is also possible to use an Adabas Directory Server or a flat file named *xtsurl.cfg*, that contains remote database URL references.

Read Adabas Data

In addition to the database ID, additional parameters, such as the file number and short name fields, need to be specified. The main class used to read data from Adabas is the `ReadRequest` class.

A simple example application (which accesses the fields AA and AB of file number 11 in database 24) would require the following settings:

```

/* Short name fields to generate the Adabas Format Buffer */
    String fields = new String{"AA","AB"};

    /* Create read request with parameter database id and file number */
    ReadRequest request = new ReadRequest(24,11).queryFields(fields);

    /* Send request and receive results */

    QueryResultList list = (QueryResultList) request.readIsnSequence();

```

The `readIsnSequence()` method sends the query to the database and the results will be collected in a list array. The list contains entries for each database record.

The following example will return the field value instance of field "AC" in the first record:

```

IRecordEntry record = list.get(0);

IAdaFieldValue fieldValueFirstName = record.getDeepFieldValuebyShortName("AC");

String firstName = fieldValueFirstName.getValue(); ←

```



Note: By default, database security is disabled, and therefore no session information is required for further initialization. As soon as the database is protected, either by authentication and/or by authorization rules, session information is required - refer to the `ReadRequest` constructors and `AdabasSession` class for further information.

Read Adabas Data using Map Definition

The mapping extension allows you to use long names instead of short names (2 byte) to reference Adabas fields. The corresponding metadata is stored in an Adabas database file (map configuration file). It is recommended that you use one configuration file per database.

Refer to the description of the Data Designer for further details about mapping.

The location of the map definition must be registered. This can be done using the `AdabasMapper` or `ReadRequest` classes:

- `AdabasMapper`

```
AdabasMapper.addMapStorage(<URL location>,<configuration file number> );
```

■ ReadRequest

```
ReadRequest request = new ReadRequest("EmployeeMap",<url to database>,<map ↵  
configuration file>).queryFields(fields);
```

The main class used to read data from Adabas is the `ReadRequest` class. The `ReadRequest` can be initialized with just the classic parameters. A simple example application requires the following statements:

```
/* Long name fields now possible */  
String fields = new String{"FirstName","LastName"};  
  
/* Create request containing needed parameters */  
ReadRequest request = new ReadRequest("EmployeeMap").queryFields(fields);  
  
/* Send request and receive result */  
QueryResultList list = (QueryResultList) request.readIsnSequence();
```

This example uses the map named `EmployeeMap`. The database ID and file number are part of the mapping information. In this example, the map defines database ID 24 and the file number 11 as the data location. File 11 is the standard employee demo file delivered with Adabas on all Linux, Unix and Windows platforms. The Adabas fields are listed in the “fields” variable. The field `FirstName` is mapped to AC and the field `LastName` is mapped to AE.

The following statements return the field value instance of field `LastName` in the first record:

```
IRecordEntry record = list.get(0);  
IAdaFieldValue fieldValueFirstName = record.getDeepFieldValueby("LastName");  
String firstName = fieldValueFirstName.getValue(); ↵
```



Note: Please look at the examples folder (mapping) delivered with the package. Compiling and executing *GenerateMappingsExample* will add two example mapping definitions named `EmployeeMap` and `VehicleMap`, which are used in the other examples. See also the tutorial *Adding the Adabas Client for Java Example Programs in Eclipse*.

Simple Search Example

The `ReadRequest` class includes extensions to support the search capabilities of Adabas.

Simple Search

The Adabas Client for Java API includes the method `setSearch`. The following table shows some example search queries.

Search	Result
AE='SMITH'	Search for records with field AE and value SMITH
AE>'ADAM'	Search for records with field AE and values greater than ADAM
AA>12345	Search for records where field AA is greater than 12345

You only need to add an additional statement to your read request :

```
String fields = new String{"AA","AB"};
/* Create request containing needed parameters */
ReadRequest request = new ReadRequest(24,11).queryFields(fields);
request.setSearch("AE='SMITH'");
/* Send request and receive result */
QueryResultList list = (QueryResultList) request.readInSequence();
```

Adabas-specific Search

A further method is to generate a search tree. Instead of using the `setSearch(...)` method, the application can generate search trees to support further Adabas search capabilities. For example, it is possible to define values for lower and upper limits:

```
RecordDefinition definition = request.addFieldQuery(fields);
/* Get field type for field AE */
AdaFieldType lastName = definition.getDeepFieldbyShortName("AE");
/* Define search tree, one node for lower limit and one node for upper limit */
SearchTree lowerTree = new SearchTree("GE", (IAdaFieldValue) ↵
lastName.getFieldValue());
lowerTree.setValue("SCHNEIDER".getBytes());
SearchTree upperTree = new SearchTree("LT", (IAdaFieldValue) ↵
lastName.getFieldValue());
upperTree.setValue("SD".getBytes());
lowerTree.bound(upperTree, SearchTree.AND);
request.setSearchTree(lowerTree);
```

This example will extract only those records that meet the specified criterion of `AE >= "SCHNEIDER"` and `AE < "SD"`.

Advanced Search Example using Super Descriptor

This example is also intended to illustrate the relationship between the Data Designer and the variable declarations in the java example programs provided - it shows screen shots from the Data Designer together with variable declarations and statements from the example *SuperdescriptorSearchExample.java*.

Group field AB.

Field	Level	Length	Type	Flags
<input type="checkbox"/> AB	1		Group	
<input type="checkbox"/> AC	2	20	Alpha	Null Value Suppression
<input type="checkbox"/> AE	2	20	Alpha	Descriptor
<input type="checkbox"/> AD	2	20	Alpha	Null Value Suppression

Super descriptor field S2.

Field	Level	Length	Type	Flags
<input checked="" type="checkbox"/> S2	1	26	Super Descriptor	Descriptor
<input checked="" type="checkbox"/> AO	2	1-6	Alpha	
<input checked="" type="checkbox"/> AE	2	1-20	Alpha	

Variable declaration from example *SuperdescriptorSearchExample.java*.

```
private static final int ADA_FILENR = 11;

private static final String ADA_DATA_GROUP = "AB";

private static final String ADA_SEARCH_FIELD = "S2";

private static final String[] ADA_DATA_FIELDS =
    { ADA_SEARCH_FIELD, ADA_DATA_GROUP };

private static final String ADA_SEARCH_VALUE = "'SALE02' 'SMITH'";

private static final String ADA_SEARCH_VALUE_TO = "'SALE02' 'ZZ'";

private static final int START_ISN = 1;

private static final int MAX_RECORDS = 1000;
```

Statements from example *SuperdescriptorSearchExample.java*.

```

try {
    /* simple Adabas Database target definition (dbid) */
    AdabasTarget target = new AdabasTarget(dbid);
    target.open();

    /* Create read request using the database target file number */
    ReadRequest request = new ReadRequest(target, ADA_FILENR);

    /* Set list of Adabas short name fields for read request */
    request.queryFields(ADA_DATA_FIELDS);

    /*
     * Define range for the result set. Set start ISN offset and a
     * maximum value of records to return.
     * Set search criteria - i.e.: S2 >= "'SALE02' 'SMITH'" &&
     *                               S2 <= "'SALE02' 'ZZ'"
     */
    request.setStart(START_ISN);
    request.setLimit(MAX_RECORDS);

    SearchTree superDescriptorSearchS2 = request.createSearchNode(
        ADA_SEARCH_FIELD, SearchTree.C.GE, ADA_SEARCH_VALUE);
    SearchTree superDescriptorSearchS2To = request.createSearchNode(
        ADA_SEARCH_FIELD, SearchTree.C.LE, ADA_SEARCH_VALUE_TO);
    superDescriptorSearchS2.bound(superDescriptorSearchS2To,
        SearchTree.Logic.AND);
    request.setSearchTree(superDescriptorSearchS2);

    /* Send request and receive result in ISN order */
    QueryResultList list = (QueryResultList) request.read();

    /* Use an internal output method to output data */
    list.output(System.out);
    if (list.size() > 0) {
        /*
         * first value in list :
         * IAdaFieldValue fieldValue =
         * list.get(0).valueOf(ADA_SEARCH_FIELD);
         */
        System.out.println("search criteria -> " + ADA_SEARCH_FIELD
            + " >= '" + ADA_SEARCH_VALUE + "' && " + ADA_SEARCH_FIELD
            + " <= '" + ADA_SEARCH_VALUE_TO + "'");
    }
    request.close();
} catch (QueryException e) {
    System.out.println(e.getMessage());
}

```


4 Main Classes

Adabas Client for Java uses a small set of classes to read or write data into or out of an Adabas database. The following table provides an overview of these main classes.

Class	Description	Example
AdabasConnection	<p>This class is used to create a main Adabas context. The parameter for AdabasConnection is an SQL-like string that contains all of the parameter needed to create a connection to Adabas. AdabasSession and AdabasTarget are created inside the AdabasConnection instance.</p>	ComplexQu
AdabasSession	<p>The AdabasSession class defines the user and security credentials. If no credentials are required, the basic Adabas ID is automatically generated.</p>	AdabasAuth
AdabasTarget	<p>The AdabasTarget class defines the Adabas target URL, and is the basic handle for Adabas access. If multiple request classes are used, the common handle underneath is the AdabasTarget instance managing synchronization.</p>	QueryWithM

Class	Description	Example
ReadRequest	<p>The ReadRequest class handles a read of Adabas data. In the ReadRequest instance, a set of fields to be read is defined. The ReadRequest creates corresponding Adabas read definitions (metadata) in order to be able to call the query. In addition, the read offset, number of records and search criteria are provide to the ReadRequest instance to manage the corresponding Adabas read or search.</p> <pre>ReadRequest request = new ReadRequest("MAP"); request.setStart(1); request.setLimit(10); request.readIsnSequence();</pre>	QueryWithMapping
StoreRequest	<p>The StoreRequest class provides update and store functionality. A StoreRequest instance can define a set of fields, and these fields can be filled with value data. If a ReadRequest reads a record entry, this entry can be modified and updated in the database using the StoreRequest instance.</p> <pre>StoreRequest request = conn.createStoreRequest(); RecordEntry entry = request.createRecordEntry(new String[] ← {"NAME"}); entry.addValue("NAME", "ADAM"); request.storeEntry(entry); ←</pre>	StoreDataWithMap
DeleteRequest	<p>The DeleteRequest class is used to delete a single ISN or a set of ISNs.</p> <pre>DeleteRequest deleteRequest = new DeleteRequest(request); deleteRequest.setIsnList(isnList.toArray(new Long[0])); deleteRequest.deleteRecords(); ←</pre>	DeleteExample.java
RecordDefinition	<p>The RecordDefinition class describes the metadata information of the set of fields in a Request. The field information in the RecordDefinition can be overwritten, for example, the name or the field type can be changed.</p>	QueryOverwriteMap
IRecordEntry	<p>The IRecordEntry interface defines a current Adabas record used by a request. The request can read or write the record entry. The RecordEntry class contains the Adabas specific hierarchical representation such Adabas groups, period groups or multiple fields.</p>	QueryUsingAdabasS
QueryResult	<p>If a listener class is using the ReadRequest, the read will return a QueryResult class instance. The instance contains a set of query information. That contains information about number of records.</p>	QueryUsingListener.
QueryResultList	<p>The QueryResultList class provides the same information as the QueryResult class, but the QueryResultList contains a list of resulting records entries. The record list is stored in memory. When compared to QueryResult, QueryResultList is not recommended to be used with large lists of records.</p>	ComplexQueryWith
QueryResultCursor	<p>QueryResultCursor is returned if readByCursor() read is used in a ReadRequest. The QueryResultCursor contains only a subset of records, unlike QueryResultList, which contains all of them.</p>	

Class	Description	Example
AdaFieldType	The <code>AdaFieldType</code> class is part of the <code>RecordDefinition</code> class. It contains all field options and metadata used in the request. In addition, map definitions and field type definitions are stored in the class instance.	QueryOverw
IAdaFieldValue	The <code>IAdaFieldValue</code> interface provides data value information of the field. <pre>IAdaFieldValue fieldValueFirstName = record.valueOf("NAME"); fieldValueFirstName.toString()</pre>	QueryWithM
IDataTypes.Types	The <code>Types</code> enumeration contains all possible types of the fields. There is a default map automatism which generates, on behalf of the Adabas field or map definition, a corresponding field type to the metadata definition. It might be the case, that the default need to be overwritten.	AdabasToCs
SearchTree	In simple queries, the <code>setSearch()</code> methods of <code>ReadRequest</code> instances might be sufficient to do search calls. For complex search queries, the <code>SearchTree</code> defines and chains a number of search criteria to a complex search.	QueryAdaba

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This tutorial provides an introduction to working with Adabas Client for Java and Eclipse.



Note: The Installation directory of Adabas Client for Java contains a set of JavaDocs for Adabas Client for Java, as well as example Java programs.

Adding the Adabas Client for Java Example Programs in Eclipse

This tutorial explains how to add the example programs from Adabas Client for Java into Eclipse. In the final step you will execute one of the example programs in Eclipse.

➤ To add example programs from Adabas Client for Java in Eclipse

This tutorial assumes that a current version of Eclipse (currently Luna 4.4.1) is installed and running on your local machine. It also assumes that you have a demo Adabas database running on your local machine.

- 1 From the Eclipse **File** menu, choose **New > Java Project**.

The New Java Project dialog is displayed.

- 2 Enter the name of the new project (for example *AdabasClientForJavaExamples*) in the in the field **Project name**. Click on the button **Finish** to create the new project.
- 3 Select the new project in the Eclipse Package Explorer, then choose **Properties** from the Eclipse **File** menu.

Or:

Right-click on the new project in the Eclipse Package Explorer, then choose **Properties** from the context menu.

The Properties for *ProjectName* dialog is displayed.

- 4 Select **Java Build Path** on the left side of the dialog, then select the **Libraries** tab on the right side of the dialog.

The JARs and class folders on the build path are listed.

- 5 Click on the button **Add External JARs...** and then select the *acj.jar* file from *install directory\AdabasClientForJava\lib*.



Note: The *install directory* (by default, this is "SoftwareAG") can be changed during the installation.

The JAR Selection dialog is displayed.

6 In the JAR Selection dialog, select the `acj-<version>`, `log4j-<version>`, `slf4j-api-<version>`, `slf4j-log4j-<version>` jar file from `install directory\AdabasClientForJava\lib`, then click on the button **Open**.

7 Click on the button **OK** in the Properties dialog to add the jar file to the Referenced Libraries.

The next step is to add the Javadoc location.

8 Expand the object `acj jar` on the right side of the Properties dialog and select **Javadoc location**, then click on the **Edit...** button.

The Javadoc for 'acj jar' dialog is displayed.

9 Select the radio button **Javadoc in archive**, then click on the **Browse...** button next to the field **Archive path**.

The Javadoc Archive Selection dialog is displayed.

10 In the Javadoc Archive Selection dialog, select the `acj javadoc jar` file from `install directory\AdabasClientForJava\lib`, then click on the button **Open** to add the Javadoc location.



Notes:

1. Add the value "docs" in the field `Path` within `Archive`.

2. Click on the button **Validate** for verification.

3. Click on the button **OK** in the dialogs `Javadoc For 'acj jar'` and `Build Path` to return to the Eclipse main screen.

The next step is to create a new Java package in the folder `src`.

11 Select the new project (in this case `AdabasClientForJavaExamples`) in the Eclipse Package Explorer, then click on the `New Java Package` icon in the tool bar.

Or:

Right-click on the new project, and then choose **New>Package** from the context menu.

The `New Java Package` dialog is displayed.

12 In the `New Java Package` dialog, enter the string `com.softwareag.adabas.query.examples.classic` in the field **Name**. Click on the button **Finish** to add the new package to the project.

Repeat this step, this time entering the string `com.softwareag.adabas.query.examples.mapping` in the field **Name**.

The next step is to import source files to the new packages.

13 Select the new package `com.softwareag.adabas.query.examples.classic` in the Eclipse Package Explorer, then choose **Import...** from the Eclipse **File** menu.

Or:

Right-click on the new package, and then choose **Import...** from the context menu.

The Import dialog is displayed.

- 14 In the Import dialog, select **General -> File System** and click on the button **Next**. In the subsequent Import dialog, click on the **Browse...** button next to the field **From directory** and navigate to the directory that contains the source files (in this case `\install directory\AdabasClientForJava\examples\classic`). Click on the **Select All** button to select all of the source files to be imported. Click on the **Finish** button to import the source files to the new package.

Repeat this step for the new package `com.softwareag.adabas.query.examples.mapping`, this time importing the source files from `\install directory\AdabasClientForJava\examples\mapping`).

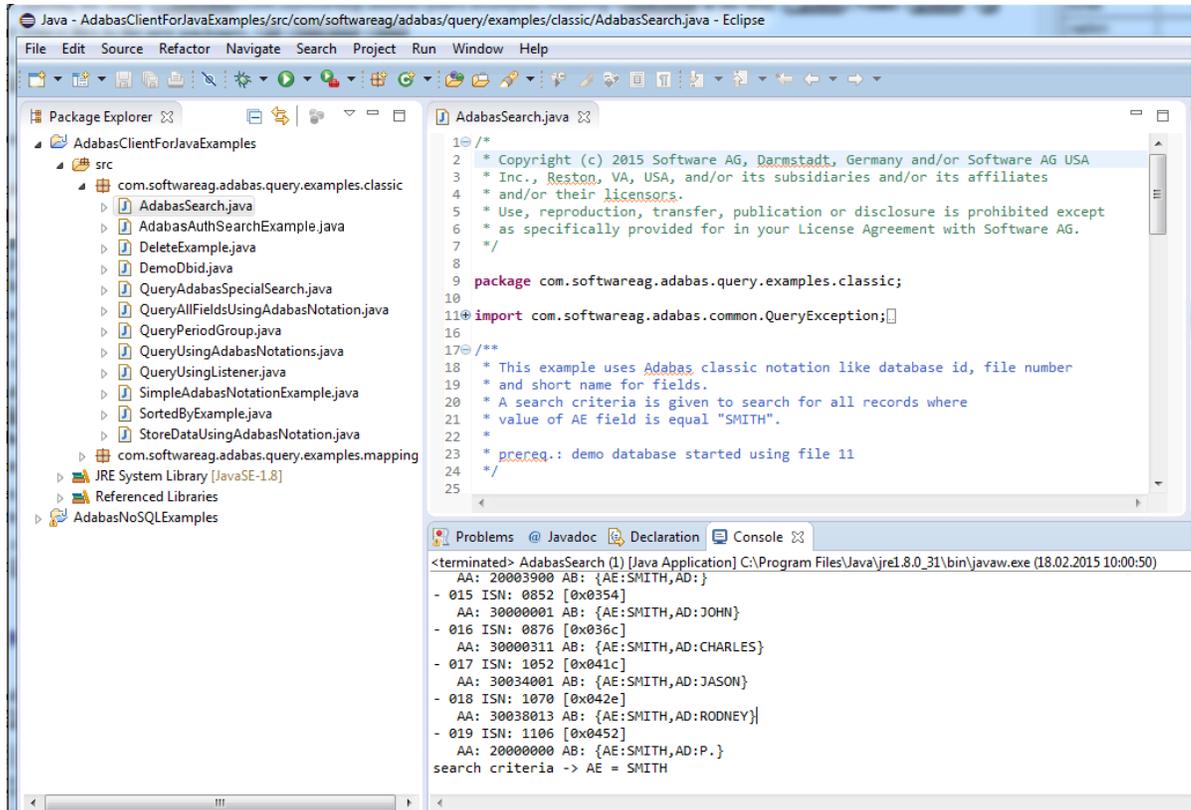
The next step is to verify that Javadoc is working correctly.

- 15 Double-click on the file `AdabasSearch.java` in the Eclipse Package Explorer to open it for editing. Move your cursor over an occurrence of the string `AdabasTarget` in the source code - the corresponding Javadoc text should be displayed in a popup window. Click on the icon **Open Attached Javadoc in Browser** to display the text in your web browser.

The final step is to execute one of the example programs.

- 16 Select the example program `AdabasSearch.java` in the Eclipse Package Explorer, then click on the run icon in the toolbar to run it; you will be prompted to enter the DBID of your demo database in the Eclipse Console window, then press Enter to run the program.

The results of running the program are displayed in the console of the Eclipse main screen, which will look something like this:



Running the Example Program AdabasAuthSearchExample

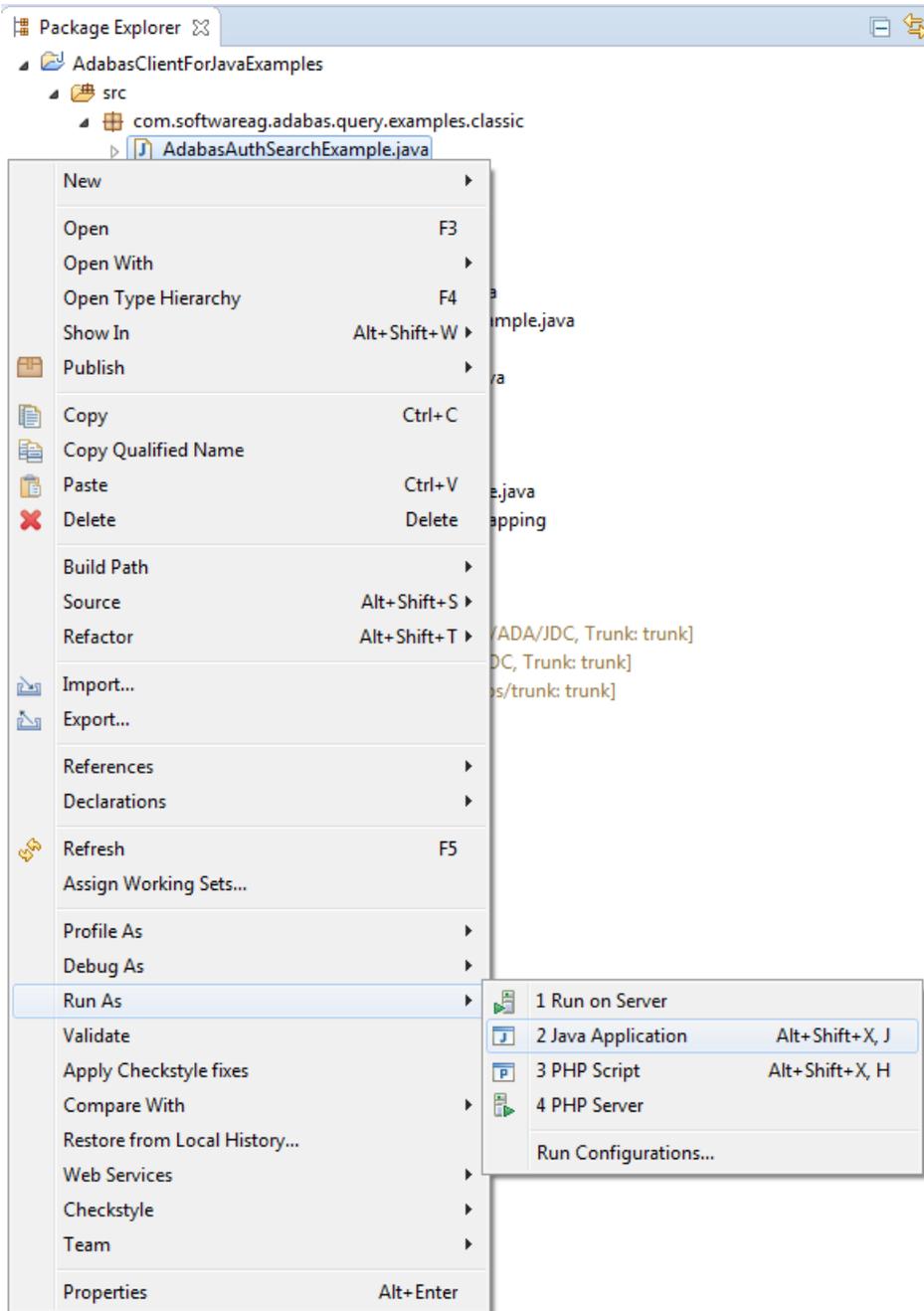
There are two ways in which the example program *AdabasAuthSearchExample* can be run from Eclipse:

- Use **Run As Java Application** - in this case, it is not possible to disable echoing of the password.
- Use **Show In Terminal** - in this case, it is possible to hide the password during input.

Examples of each case (including output) are shown below; in each case, you must first select the example program *AdabasAuthSearchExample.java* in the Eclipse Package Explorer.

Example: Run As Java Application

Click on **Run As -> Java Application** from the toolbar, as shown below:



The output in the IDE console window will look something like this:

```

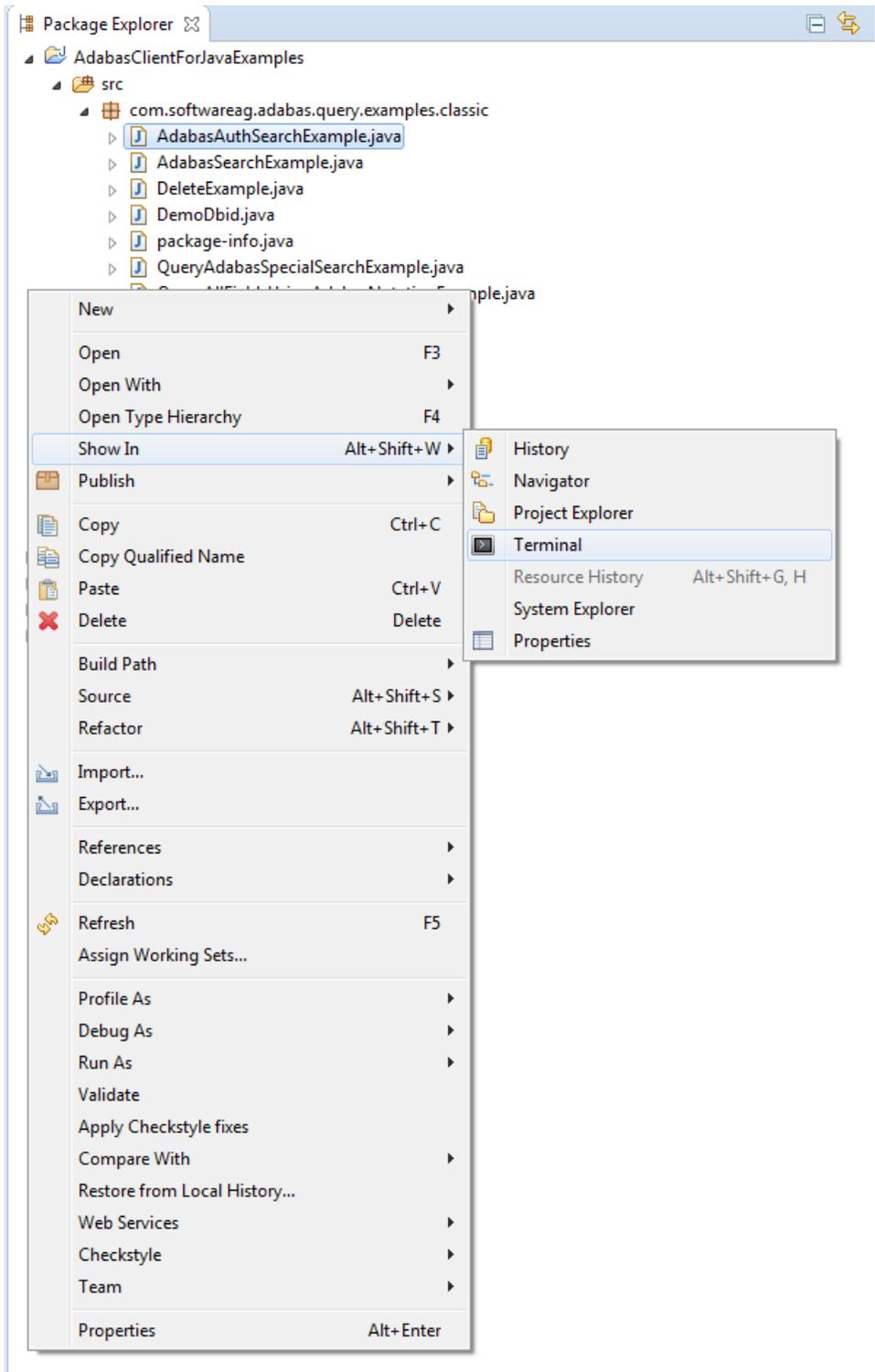
<terminated> AdabasAuthSearchExample [Java Application] C:\JavaAnt\Java\jre7\bin\javaw.exe (15.07.2015 14:21:03)

*** Please enter valid dbid of your Adabas Demo Database [1 .. 255] > 25
Security violation - Please enter your username and password.
warning: Couldn't get Console instance ... disable echoing not possible !
Username > sag
Password > sag
NrRecords: 19 Size: 19
- 001 ISN: 0526 [0x020e]
  AA: 40000311 AB: {AE:SMITH,AD:KRUSE}
- 002 ISN: 0581 [0x0245]
  AA: 20009300 AB: {AE:SMITH,AD:C.}
- 003 ISN: 0626 [0x0272]
  AA: 20014100 AB: {AE:SMITH,AD:M.}
- 004 ISN: 0639 [0x027f]
  AA: 20015400 AB: {AE:SMITH,AD:PHYLLIS}
- 005 ISN: 0669 [0x029d]
  AA: 20018800 AB: {AE:SMITH,AD:HENRY}
- 006 ISN: 0716 [0x02cc]
  AA: 20023600 AB: {AE:SMITH,AD:HENRY}
- 007 ISN: 0732 [0x02dc]
  AA: 20025200 AB: {AE:SMITH,AD:HENRY}
- 008 ISN: 0776 [0x0308]
  AA: 20029800 AB: {AE:SMITH,AD:PHYLLIS}
- 009 ISN: 0785 [0x0311]
  AA: 20000400 AB: {AE:SMITH,AD:HENRY}
- 010 ISN: 0791 [0x0317]
  AA: 20001000 AB: {AE:SMITH,AD:JENNIFER}
- 011 ISN: 0799 [0x031f]
  AA: 20001900 AB: {AE:SMITH,AD:}
- 012 ISN: 0807 [0x0327]
  AA: 20002300 AB: {AE:SMITH,AD:R.}
- 013 ISN: 0816 [0x0330]
  AA: 20003200 AB: {AE:SMITH,AD:HENRY}
- 014 ISN: 0822 [0x0336]
  AA: 20003900 AB: {AE:SMITH,AD:}
- 015 ISN: 0852 [0x0354]
  AA: 30000001 AB: {AE:SMITH,AD:JOHN}
- 016 ISN: 0876 [0x036c]
  AA: 30000311 AB: {AE:SMITH,AD:CHARLES}
- 017 ISN: 1052 [0x041c]
  AA: 30034001 AB: {AE:SMITH,AD:JASON}
- 018 ISN: 1070 [0x042e]
  AA: 30038013 AB: {AE:SMITH,AD:RODNEY}
- 019 ISN: 1106 [0x0452]
  AA: 20000000 AB: {AE:SMITH,AD:P.}
search criteria -> AE = SMITH

```

Example: Show In Terminal

Click on **Show In -> Terminal** from the toolbar, as shown below:



The output in the IDE classic Terminal window will look something like this:

```

Problems @ Javadoc Search Console classic
sac@MCSAC01 /c/ACJDEV-workspace/AdabasClientForJavaExamples/src/com/softwareag/adabas/query/examples/classic
$ cd /c/ACJDEV-workspace/AdabasClientForJavaExamples/bin

sac@MCSAC01 /c/ACJDEV-workspace/AdabasClientForJavaExamples/bin
$ export CLASSPATH=".;C:\testenv\acjv10\acjv10\AdabasClientForJava\lib\acj-v1.0.1.0.1192.jar"

sac@MCSAC01 /c/ACJDEV-workspace/AdabasClientForJavaExamples/bin
$ java com/softwareag/adabas/query/examples/classic/AdabasAuthSearchExample

*** Please enter valid dbid of your Adabas Demo Database [1 .. 255] > 25
Security violation - Please enter your username and password.
Username > sag
Password >
NrRecords: 19 Size: 19
- 001 ISN: 0526 [0x020e]
  AA: 40000311 AB: {AE:SMITH,AD:KRUSE}
- 002 ISN: 0581 [0x0245]
  AA: 20009300 AB: {AE:SMITH,AD:C.}
- 003 ISN: 0626 [0x0272]
  AA: 20014100 AB: {AE:SMITH,AD:M.}
- 004 ISN: 0639 [0x027f]
  AA: 20015400 AB: {AE:SMITH,AD:PHYLLIS}
- 005 ISN: 0669 [0x029d]
  AA: 20018800 AB: {AE:SMITH,AD:HENRY}
- 006 ISN: 0716 [0x02cc]
  AA: 20023600 AB: {AE:SMITH,AD:HENRY}
- 007 ISN: 0732 [0x02dc]
  AA: 20025200 AB: {AE:SMITH,AD:HENRY}
- 008 ISN: 0776 [0x0308]
  AA: 20029800 AB: {AE:SMITH,AD:PHYLLIS}
- 009 ISN: 0785 [0x0311]
  AA: 20000400 AB: {AE:SMITH,AD:HENRY}
- 010 ISN: 0791 [0x0317]
  AA: 20001000 AB: {AE:SMITH,AD:JENNIFER}
- 011 ISN: 0799 [0x031f]
  AA: 20001900 AB: {AE:SMITH,AD:}
- 012 ISN: 0807 [0x0327]
  AA: 20002300 AB: {AE:SMITH,AD:R.}
- 013 ISN: 0816 [0x0330]
  AA: 20003200 AB: {AE:SMITH,AD:HENRY}
- 014 ISN: 0822 [0x0336]
  AA: 20003900 AB: {AE:SMITH,AD:}
- 015 ISN: 0852 [0x0354]
  AA: 30000001 AB: {AE:SMITH,AD:JOHN}
- 016 ISN: 0876 [0x036c]
  AA: 30000311 AB: {AE:SMITH,AD:CHARLES}
- 017 ISN: 1052 [0x041c]
  AA: 30034001 AB: {AE:SMITH,AD:JASON}
- 018 ISN: 1070 [0x042e]
  AA: 30038013 AB: {AE:SMITH,AD:RODNEY}
- 019 ISN: 1106 [0x0452]
  AA: 20000000 AB: {AE:SMITH,AD:P.}
search criteria -> AE = SMITH

sac@MCSAC01 /c/ACJDEV-workspace/AdabasClientForJavaExamples/bin
$ █

```


6 Messages

The following response codes are returned if errors occur while processing.

ACJ00000	Internal error, please provide Exception stack for additional analysis
Action	Internal error, please send the exception and the trace log to your nearest support centre for detailed information.
ACJ00001	"{0}" Field length {1} for BINARY not valid
Action	Field length of field type Fixed is not correct (correct is length 1,2,4 or 8).
ACJ00002	Field [{0}] not found on target database {1} in file {2}
Action	Use a correct field name which is part of the FDT or Adabas Map.
ACJ00005	No ISN selected for deletion
Action	Provide at least one ISN to be deleted.
ACJ00006	For field {0} an unknown type {1} is used
Action	An internal error has occurred, please send the exception and the trace log to your nearest support centre for detailed information.

- ACJ00007** **Configuration entry {0} not found**
Action The Adabas Map does not exist, provide the name of an existing Adabas Map.
- ACJ00008** **Byte order mismatch, correct order needed for this method**
Action An internal error has occurred, please send the exception and the trace log to your nearest support centre for detailed information.
- ACJ00009** **Linux/Unix/Windows Adabas is supported only**
Action The destination platform is not supported.
- ACJ00010** **Given ISN list empty**
Action The given ISN list is empty, provide an ISN list with at least one entry.
- ACJ00011** **Record buffer parse error**
Action An internal error has occurred, please send the exception and the trace log to your nearest support centre for detailed information.
- ACJ00012** **Data type field not given**
Action Provide the correct data parameter for the methods valueOf().
- ACJ00013** **Value for field with name {0} not found**
Action Provide the correct field name parameter for the field value instance.
- ACJ00014** **Field {0} not found in referenced record definition (Deep Field)**
Action Provide the correct existing short name parameter for the field value search.
- ACJ00015** **Field {0} not found in referenced record definition (new instance)**
Action Please send the exception and the trace log to your nearest support centre for detailed information.

ACJ00016	Error during record buffer parsing: {0}
Action	Parser data error, please send the exception and the trace log to your nearest support centre for detailed information.
ACJ00017	Given data object is not valid
Action	Parser data error, please send the exception and the trace log to your nearest support centre for detailed information.
ACJ00018	Error during record buffer generation before call
Action	Field data error, please send the exception and the trace log to your nearest support centre for detailed information.
ACJ00019	Non-descriptor field found in sorted_by request
Action	A non-descriptor field is used for descriptor read.
ACJ00021	List size not correct
Action	A list of ISNs with none or more than one entries is given. Provide exactly one ISN entry.
ACJ00022	Adabas Response code received: {0}
Action	A multifetch Adabas record entry contains a response code which is not ADA_NORMAL, ADA_EOF or ADA_INVIS.
ACJ00023	Buffer too small to parse record values
Action	Buffer received is too small, please send the exception and the trace log to your nearest support centre for detailed information.
ACJ00024	Field with long name {0} already added to Map
Action	The field long name is already used in the Adabas Map, use a different name.
ACJ00025	For field {0} the corresponding group is not found
Action	Field name level>1 is incorrect. The group of the field is not found.

- ACJ00026** **Group entries null {0}**
Action Field defined as group has no field entries.
- ACJ00027** **FDT format identifier {0} not found**
Action The FDT contains the wrong field type, correct the FDT.
- ACJ00029** **Unknown external exception thrown: {0}**
Action Unknown Java exception thrown during read. Analyse the Java exception.
- ACJ00030** **Adabas returned response: {0}**
Action There is a security problem sending Adabas calls. Please check the security response.
- ACJ00031** **Field {0} not found in referenced record entry**
Action The given field name is incorrect, provide a correct field name.
- ACJ00032** **Value for field with short name {0} not found**
Action The given field name is incorrect, provide a correct field name.
- ACJ00033** **{0} field length {1} for floating point value not valid**
Action The given field length for floating point types is incorrect.
- ACJ00034** **Adabas map configuration with name {0} does not exist or is not unique**
Action The Adabas Map name is not unique or not valid. Please correct Adabas Map name.
- ACJ00035** **Unknown Exception from outside ACJ context: {0}**
Action An illegal, security or special Java exception is thrown during execution. Analyse the Java exception.
- ACJ00036** **Record with ISN={0} not found**
Action ISN record not found. Provide an ISN record which is part of the list.

ACJ00038	Input buffer too small while parsing {0} pos {1} remaining buffer is of size {2}
Action	Size mismatch during parser step, use the correct platform order endiness.
ACJ00039	Buffer endianness wrong
Action	The buffer endiness is incorrect, use the correct platform order endiness.
ACJ00040	Search on groups is not supported, {0} is a group
Action	The given field name is a group. A search cannot be performed on groups.
ACJ00041	Redefinition on groups not allowed ({0} is group)
Action	The given field name is a group. Redefinitions cannot be performed on groups
ACJ00047	This function is not supported for the destination platform
Action	The destination platform does not support the functionality.
ACJ00049	Field \"{0}\" not found in referenced map \"{1}\"
Action	Provide a field name which is part of the Adabas Map.
ACJ00050	Define Adabas File fields before creating file
Action	Manual FDT parser is not correct. Use another type.
ACJ00051	No definitions found in file {0}
Action	Adabas Mapper import file error, check the file structure.
ACJ00055	Type conversion not possible
Action	The value conversion to value requested is not possible.
ACJ00057	Field/Column \"{0}\" not found in target map {1}
Action	The field with provided name is not part of the Adabas Map.

- ACJ00058** **No PE/MU element with index {0} found**
Action The given index is not available in the period group or multiple field.
- ACJ00059** **No group or list entry found in {0}**
Action The given index is not available in the group.
- ACJ00064** **Record unique field content of field {0} does already exist in {1}**
Action Change the value provided to another value.
- ACJ00065** **No configuration for \"{0}\" found**
Action The requested Adabas Map with the given name does not exist.
- ACJ00066** **Value {0} for packed field {1} does not fit into {2}-array**
Action The packed value size does not fit into given memory space.
- ACJ00067** **Invalid session reference given**
Action The given Adabas connection string is not valid.
- ACJ00068** **Administration not validated**
Action The given administration command key is not valid.
- ACJ00069** **Input file containing definitions missing**
Action A file name was not provided. Add the corresponding file name option.
- ACJ00071** **File {0} already loaded**
Action The FNR of the new Adabas file already exists in the database.
- ACJ00072** **Advanced index functionality not available**
Action The advanced index class is not defined.

ACJ00073	Error during advanced index registration: {0}
Action	Incorrcet advanced index class register attempt.
ACJ00074	Invalid Adabas Map version received in record data
Action	The Adabas Map name cannot be interpreted by this Adabas Client for Java version.
ACJ00075	Join reference wrong, map \"{0}\" not found
Action	The given Adabas Map containing the join definition was not found.
ACJ00076	Connection parse error: {0}
Action	Special Java exception. Check the stack trace.
ACJ00077	Advanced indexer instance with name {0} not found
Action	The given index name is not registered. Register the advanced index with the given name.
ACJ00078	Field {0} is no period group or multiple field
Action	Cannot check the quantifier on fields other then periodic group or multiple fields.
ACJ00079	More then one descriptor in descriptor read given
Action	Found more then one descriptor in query.
ACJ00080	Missing descriptor in descriptor read
Action	There is no descriptor found in the descriptor read query.
ACJ00081	Field {0} in descriptor read is not a descriptor
Action	There is no descriptor part of the query.
ACJ00082	Sort key need to be defined using descending order
Action	Search query problem, the given combination is not allowed.

- ACJ00083** **Descending ISN order read is not supported, provide descriptor**
Action Sort keys and descending order are not allowed.
- ACJ00084** **Period group element {0} need an index to add value to record**
Action Provide an index to add the value.
- ACJ00085** **Multiple field {0} element need an index to add value to record**
Action Provide an index to add the value.
- ACJ00086** **Problem to initiate a privileged session to Adabas**
Action Problem establishing Adabas Mainframe administration tasks. Check Adabas Mainframe support.
- ACJ00087** **Platform connection error. Target system is no Mainframe platform**
Action Administration tasks only available on target Adabas Mainframe databases
- ACJ00088** **Adabas Cluster session problem: {0}**
Action The target Adabas Mainframe databases is a cluster.
- ACJ00089** **Internal error evaluating target platform**
Action Internal error evaluating the remote database type occurred. Contact your nearest support centre for further information.
- ACJ00090** **Internal error tries exceed to get Mainframe file in complete**
Action Adabas mainframe loop read of file list tries exceeded.
- ACJ00091** **Buffer parser error: Negative length received during parsing {0} on position {1}**
Action Adabas byte array length not valid for given data.
- ACJ00092** **Internal error while parsing map definition fields**
Action An internal error has occurred. Contact your nearest support centre for further information.

ACJ00093	File handler received wrong super descriptor definition on {0}
Action	Invalid definition of super descriptor.
ACJ00094	Maximum allowed number of sort keys is {0}
Action	The number of sort descriptors exceeds the maximum allowed number of sorting fields.
ACJ00095	Given value {0} for field {1} is not numeric
Action	The given string is not a valid integer value.
ACJ00096	Found faulty field short name {0} configuration in Adabas Map {1}
Action	The read short name definition is not correct. Validate the Adabas Map definition.
ACJ00097	More then one sort key without a search criteria is not valid. Please add a search criteria
Action	Please provide only one sort key if no search criteria is given.
ACJ00098	Requested field {0} to drop is not part of the FDT
Action	Provide correct field name which is part of the Adabas file definition table.
ACJ00099	Requested field {0} to drop is descriptor field
Action	Provide a correct field name which is not a descriptor.
ACJ00100	DS and NODS cannot be define at once
Action	Use the correct Adabas file flag.
ACJ00101	ISN and NOISN cannot be define at once
Action	Use the correct Adabas file flag.
ACJ00102	Given character set with name \"{0}\" not known
Action	During charset parsing, an Java specific exception is thrown. Check the exception.

- ACJ00103** **Given authorization security type \"{0}\" is unknown**
Action During authorization parsing, an Java specific exception is thrown. Check the exception.
- ACJ00104** **Record with ISN={0} not found on database {1} file {2}**
Action The specific ISN is not found. Provide an existing ISN in the database.
- ACJ00106** **Query results contains no list of records**
Action List not available if query collector callbacks are used.
- ACJ00107** **Read logical search criteria must contain one descriptor only**
Action The field name part of the search is not a descriptor being used by a histogram query.
- ACJ00109** **SYSOBJH export file does not contains {0}/{1}**
Action The search DDM field name is not part of the SYSOBJH file.
- ACJ00110** **Special descriptor {0} could not be modified directly**
Action The given field cannot be modified directly. Do not use special descriptors like sub-, super- or other special descriptors.
- ACJ00111** **Configuration target not defined in configuration of \"{0}\"**
Action The Adabas Map is not correctly defined. Check the target parameters of the Adabas Map.
- ACJ00112** **Configuration name not defined in configuration**
Action The Adabas Map is not correctly defined. Check the map name parameters of Adabas Map.
- ACJ00113** **Search not valid: {0}**
Action The search query not correctly defined. Check the name and value criteria.

ACJ00114	User queue element {0} not found
Action	The user queue entry cannot be found and is no longer available.
ACJ00115	Valid boolean values for {0} are YES,NO,ON,OFF,TRUE,FALSE
Action	No valid boolean value was found, check the boolean value.
ACJ00116	Reopen is needed to enable character set encoding needed for this query, transaction open
Action	Although a transaction is pending, the Adabas connection needs to be reopened to work with wide-character fields.
ACJ00117	Field query list is not provided
Action	The field list to be read is not correctly defined.
ACJ00118	Adabas Map field configuration not valid, reference error
Action	The Adabas Map has a reference error, connections to the data target are not working correctly.
ACJ00119	Adabas connection Map repository sharing not valid
Action	The Adabas connection target Adabas Map target is redefined and the connection open.
ACJ00120	Adabas connection Data target reference sharing not valid
Action	The Adabas connection target Adabas data target is redefined and the connection open.
ACJ00121	Error parsing FDT in line of field {0}
Action	The Adabas file definition table is not valid. Adabas state error.
ACJ00256	Structure sub tree for group {0} not initialized
Action	Internal error, Adabas field definition table seems to be invalid.

ACJ00257	Input value size {0} of field {1} is greater then maximal length {2}
Action	Input value size does not fit into the field, and truncation is not set.
ACJ00258	Invalid type {0} put in field {1} of type {2}
Action	Value parameter is not valid.
ACJ00259	ISN 0 not allowed to be deleted, wrong entry in list
Action	Incorrect parameter ISN 0 is defined, the ISN value needs to be greater than 0.
ACJ00260	Unsigned type should not set negative value
Action	Unsigned type is not allowed to set negative values.
ACJ00261	Given values size of {2} for {0} is not valid for this Adabas type representation, {1} needed
Action	Parameter type is not handled to set integer values.
ACJ00262	Value of field {0} with type {1} and length {2}.{3} exceeds maximum valid length of {4}
Action	The value length exceeds the maximum allowed length.
ACJ00263	Parse error in field {0}, current offset {1} is out of maximum buffer size {2}
Action	Error parsing the received buffer. The buffer appears to be invalid.
ACJ00264	Current Adabas type {0} does not have a date format definition, input type Date.class incorrect
Action	There is no valid format identifier defined for the Date instance to be parsed.
ACJ00265	No matching request found for type {0}
Action	The given parameter to create a request is not sufficient. Check the parameter.

ACJ00266	Cannot get File Definition Table for file {1} in database {0}
Action	File definition table read error. Check the Adabas file status.
ACJ00267	Error evaluating Adabas type for field {0}
Action	Internal error. Contact your nearest support centre for further information.
ACJ00269	Record buffer parse error, incorrect offset found for ISN {0}
Action	Internal error. Contact your nearest support centre for further information.
ACJ00270	Record buffer of size {0} cannot be created
Action	Internal error. Contact your nearest support centre for further information.
ACJ00271	Record definition is not available
Action	Adabas result field list is not defined correctly.
ACJ00272	FDT definition is null
Action	The given file definition table is not valid. Provide a correct file definition table.
ACJ00277	Parameter reference contains null value
Action	The comparator or name are not valid. Check the search parameter.
ACJ00278	A index value of {0} is invalid. Valid indexes are -1 for no index or >1
Action	The given period group and multiple-value index not correct. Check the index.
ACJ00280	Value of field {0} with type {1} and length {2} exceeds maximum valid length of {3}
Action	The length exceeds the maximum permitted length of the field.
ACJ01000	Selected resource is no Adabas Map
Action	The length exceeds the maximum permitted length of the field.

